

CCD camera

KP-FD140F

KP-FD32F

KP-F140F

KP-F32F

KP-F83F



Operation Manual

Thank you for producing this fine Hitachi Kokusai Electric CCD camera.

Before using the camera, please read this operation manual carefully and keep this manual on file for ready reference in the future.

RoHS Compliant

These products compile with the requirement of the RoHS (Restriction of the use of Certain Hazardous Substances in Electrical and electronic Equipment) Directive 2002/95/EC.

Hitachi Kokusai Electric

Declaration of Conformity

Manufacturer's Name: Hitachi Kokusai Electric, Inc.
 Manufacturer's Address: 4-14-1 Sotokanda, Chiyoda-ku,
 Tokyo 101-8980, Japan

Representative(s) Address Hitachi Kokusai Electric Europe GmbH
 in the EU: Weiskircher Straße 88,
 Jügesheim D-63110 Rodgau, Germany

Hitachi Kokusai Electric U.K. Ltd.
 Windsor House, Britannia Road,
 Waltham Cross, Hertfordshire,
 EN8 7NX United Kingdom

declares, that the product:

Product Name: CCD Camera
 Model Number(s): KP-F140F
 KP-FD140F

conforms to the following Standards:

EMC: EN 61000-6-3/2001
 EN 61000-6-1/2001

Supplementary Information:

"The product complies with the requirements of the Low Voltage
 Directive 73/23/EEC and the EMC Directive 89/336/EEC."

Signature:

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Senior Manager
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Date: 1st Mar.2006

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 Windsor House, Britannia Road,
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 EN8 7NX United Kingdom

declares, that the product:

Product Name: CCD Camera
 Model Number(s): KP-P32P
 KP-PD32P

conforms to the following Standards:

EMC: EN 61000-6-3/2001
 EN 61000-6-1/2001

Supplementary Information:

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Product Name: CCD Camera
 Model Number(s): KP-F83P

conforms to the following Standards:

EMC: EN 61000-6-3/2001
 EN 61000-6-1/2001

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 Hitachi Kokusai Electric Inc.
 Managing Director
 Hitachi Kokusai Electric Europe GmbH
 Hitachi Kokusai Electric U.K. Ltd.

Date: 10th Apr.2006

IMPORTANT SAFETY INSTRUCTIONS

1. Read Instructions

All the safety and operating instructions should be read before the product is operated.

2. Retain Instructions

The safety and operating instructions should be retained for future reference.

3. Heed Warnings

All warnings on the product and the operating instructions should be adhered to.

4. Follow Instructions

All operating and use instructions should be followed.

5. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6. Attachments

Do not use attachments not recommended by the product manufacturer as they may cause hazards.

7. Water and Moisture

Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.

8. Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

9. Moving

A product and cart combination should be moved with care.

Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

10. Ventilation

Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered.

The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

11. Power Sources

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

12. Grounding or Polarization

This product is equipped with a three-wire grounding-type plug a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

13. Power-Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plug, convenience receptacles, and the point where they exit from the product.

14. Lightning

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.

15. Overloading

Do not overload wall outlets, extension cords or integral convenience receptacles as this can result in a risk of fire or electric shock.

16. Object and Liquid Entry

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

17. Inflammable and Explosive Substance

Avoid using this product where there are gases, and also where there are inflammable and explosive substances in the immediate vicinity.

18. Heavy Shock or Vibration

When carrying this product around, do not subject the product to heavy shock or vibration.

19. Servicing

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

20. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or damaged in any way.
- f. When the product exhibits a distinct change in performance-this indicates a need for service.

21. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part.

Unauthorized substitutions may result in fire, electric shock, or other hazards.

22. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

23. Wall or Ceiling Mounting

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

24. Heat

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

WICHTIGE SICHERHEITSANWEISUNGEN

1. Alle Anweisungen lesen

Vor Betrieb des Erzeugnisses sollten alle Sicherheits-und Bedienungsanleitungen gelesen werden.

2. Die Anweisungen aufbewahren

Die Sicherheits-und Bedienungsanleitungen sollten fünftigen Bezug aufbewahrt werden.

3. Warnungen beachten

Die Warnungen auf dem Erzeugnis und in den Bedienungsanleitungen sollten beachtet werden.

4. Anweisungen befolgen

Alle Bedienungsanleitung-und
Verwendungsanweisungen sollten befolgt werden.

5. Reinigung

Den Stecker des Geräts vor Reinigung aus der Steckdose ziehen. Keine flüssigen Reinigungsmittel oder Aerosolreiniger verwenden. Zum Reinigen einen feuchten Lappen verwenden.

6. Zubehör

Nur vom-Hersteller des Erzeugnisses empfohlenes Zubehör verwenden, da es sonst zu Störungen kommen kann.

7. Wasser und Feuchtigkeit

Dieses Erzeugnis nicht in der Nähe von Wasser verwenden - z.B, in der Nähe einer Badewanne, eines Waschbeckens, einer Küchenspüle, eines Waschzubers, in einem nassen Keller, in der Nähe eines Schwimmbeckens usw.

8. Aufstellung

Das Erzeugnis nicht auf einen instabilen Wagen, Stand, Dreifuß, Träger oder Tisch stellen.

Das Erzeugnis kann sonst herunterfallen und ein Kind oder einen Erwachsenen schwer verletzen.

Außerdem kann das Gerät schwer beschädigt werden. Nur mit einem Wagen, Stand, Dreifuß, Träger oder Tisch verwenden, der vom Hersteller empfohlen oder mit dem Erzeugnis verkauft worden ist. Für jegliche Anbringung sollten die Anweisungen des Herstellers befolgt werden, und das vom Hersteller empfohlene Anbringungszubehör sollte verwendet werden.

9. Eine Kombination von Erzeugnis und Wagen sollte vorsichtig bewegt werden

Schneller Halt, übermäßige Krafteinwirkung und unebene Oberflächen können Umkippen der Kombination von Erzeugnis und Wagen verursachen.

10. Ventilation

Schlitze und Öffnungen im Gehäuse dienen der Ventilation. Sie sind für zuverlässigen Betrieb des Gerätes und Schutz vor Überhitzung erforderlich und dürfen nicht blockiert oder abgedeckt werden. Die Öffnungen sollten niemals dadurch blockiert werden, daß, das Gerät auf ein Bett, ein Sofa, einen Teppich oder eine ähnliche Oberfläche gestellt wird.

Das Gerät sollte nur dann in Einbauinstallation wie in einem Bücherschrank oder einem Gestell verwendet werden, wenn angemessene Ventilation vorgesehen ist bzw. Die Anweisungen des Herstellers befolgt worden sind.

11. Stromversorgung

Dieses Erzeugnis sollte nur an der auf dem Typenschild angegebenen Stromversorgungsart betrieben werden. Wenn Sie nicht sicher sind, was für eine Stromversorgung Sie haben, so wenden Sie sich bitte an Ihren Erzeugnishändler oder an das lokale Elektrizitätswerk. Beziehen Sie sich für Batteriebetrieb oder andere Stromquellen vorgesehene Erzeugnisse bitte auf die Bedienungsanleitungen.

12. Erdung oder Polarisierung

Dieses Erzeugnis ist mit einem Schutzkontaktstecker mit drei Leitern ausgerüstet, mit einem Erdungskontakt. Dieser Stecker paßt nur in eine schuko-Steckdose. Dies ist eine Sicherheitsmaßnahme. Wenn Sie den Stecker nicht in die Steckdose stecken können, so wenden Sie sich bitte an Ihren Elektriker, damit er die veraltete Schutz des Schutzkontaktsteckers unwirksam macht.

13. Netzkabelschutz

Netzkabel sollten so verlegt werden, daß möglichst nicht darauf getreten wird und daß sie nicht eingeklemmt werden, mit besonderer Beachtung der Kabel an Stackern, Verlängerungskabeln und dem Austritt des Kabels aus dem Erzeugnis.

14. Blitzschlag

Für zusätzlichen Schutz des Erzeugnisses während eines Gewitters oder bei Nichtverwendung für lange Zeit den Stecker aus der Steckdose ziehen. Dies verhindert Beschädigung durch Blitzschlag und Netzspannungsschöße.

15. Überlastung

Wandsteckdosen, Verlängerungskabel und eingebaute Bequemlichkeitssteckdosen nicht überlasten, da dies Feuer oder elektrischen Schlag verursachen kann.

16. Eindringen von Fremdkörpern und Flüssigkeit

Niemals Objekte irgendwelcher Art durch die Öffnungen in das Gerät schieben, da diese unter hoher Spannung stehende Teile berühren oder kurzschließen können, wodurch es zu Feuer oder elektrischem Schlag kommen kann. Niemals Flüssigkeiten irgendwelcher Art auf das Erzeugnis verschütten.

17. Entflammbare und explosive Substanzen

Vermeiden Sie Verwendung dieses Erzeugnisses an Orten mit Gasen bzw. entflammbaren oder explosiven Substanzen in der direkten Umgebung.

18. Starke Stöße oder Vibrationen

Setzen Sie das Erzeugnis beim Transport nicht starken Stößen oder Vibrationen aus.

19. Wartung

Versuchen Sie nicht, dieses Erzeugnis selbst zu warten, da Sie sich durch Öffnen bzw. Entfernen von Abdeckungen hohen Spannungen und sonstigen Gefährdungen aussetzen können.

Beziehen Sie sich für jegliche Wartung auf qualifiziertes Wartungspersonal.

20. Beschädigung, die Wartung erfordert

Ziehen Sie den Stecker dieses Erzeugnisses aus der Steckdose und wenden Sie sich an qualifiziertes Wartungspersonal, wenn eine der folgenden Bedingungen vorliegt:

- a. Wenn das Netzkabel oder der Stecker beschädigt ist.
- b. Bei Eindringen von Flüssigkeit oder Fremdkörpern in das Gerät.
- c. Wenn das Erzeugnis Regen oder Wasser ausgesetzt worden ist.
- d. Wenn das Erzeugnis bei Befolgen der Bedienungsanleitungen nicht normal funktioniert.

Nur die Regelemente verstellen, die in den Bedienungsanleitungen behandelt werden, da unangemessene Einstellung anderer Regelemente Beschädigung verursachen kann und oft beträchtliche Arbeit durch einen qualifizierten Techniker erfordert, um das Erzeugnis wieder zu normalem Betrieb zurückzubringen.

- e. Wenn das Erzeugnis fallen gelassen oder beschädigt worden ist.
- f. Wenn das Erzeugnis eine klare Änderung in der Leistung zeigt-dies weist darauf hin, daß Wartung erforderlich ist.

21. Ersatzteile

Wenn Ersatzteile erforderlich sind, darauf achten, daß der Wartungstechniker nur die vom Hersteller festgelegten Ersatzteile oder Teile mit den gleichen Charakteristiken wie die ursprünglichen Teile verwendet. Unautorisierte Ersatzteile können Feuer, elektrischen Schlag oder sonstige Gefährdungen verursachen.

22. Sicherheitsprüfung

Bitten Sie den Wartungstechniker nach der Vervollendung von Wartung oder Reparaturarbeiten an diesem Erzeugnis um die Durchführung von Sicherheitsprüfungen, um zu bestimmen, daß das Erzeugnis im angemessenen Betriebszustand ist.

23. Anbringung an der Wand oder an der Decke

Das Erzeugnis sollte nur entsprechend den Empfehlungen des Herstellers an einer Wand oder an der Decke angebracht werden.

24. Wärme

Das Erzeugnis sollte fern von Wärmequellen wie Radiatoren, Heizwiderständen, Öfen und anderen Wärme erzeugenden Erzeugnissen (einschließlich Verstärkern) aufgestellt werden.

MISES EN GARDE IMPORTANTES

1. Lire les instructions

Lire toutes les instructions de sécurité et de fonctionnement avant de faire fonctionner l'appareil.

2. Conserver ces instructions

Conserver les instructions de sécurité et de fonctionnement à des fins de référence ultérieure.

3. Tenir compte des avertissements

Tous les avertissements qui figurent sur l'appareil et dans le mode d'emploi devront être respectés.

4. Observer les instructions

Observer toutes les instructions de fonctionnement et d'utilisation.

5. Nettoyage

Avant de procéder au nettoyage, débrancher l'appareil de la prise secteur. Ne pas utiliser de produits de nettoyage liquides ou en aérosol.

Nettoyer l'appareil avec un chiffon humide.

6. Fixations

Ne pas utiliser de fixations non recommandées par le fabricant de l'appareil car elles pourraient être source de danger.

7. Eau et humidité

Ne pas utiliser l'appareil à proximité d'eau - par exemple près d'une baignoire, d'un lavabo, d'un évier ou d'un bac à lessive, dans un sous-sol humide, ou près d'une piscine, etc.

8. Accessoires

Ne pas placer l'appareil sur un chariot, un socle, un pied, un support ou une table instables. L'appareil pourrait tomber, blessant grièvement des enfants ou des adultes, et étant sérieusement endommagé.

Utiliser exclusivement le chariot, le socle, le pied, le support ou la table recommandés par le fabricant, ou vendus avec l'appareil. Pour tout montage de l'appareil, respecter les instructions du fabricant, et utiliser à cette fin l'accessoire de montage recommandé par le fabricant.

9. L'appareil monté sur son chariot devra être déplacé avec précaution

Des arrêts brusques, une force excessive et des surfaces irrégulières pourraient provoquer le renversement de l'ensemble appareil-chariot.

10. Ventilation

Les fentes et les ouvertures du coffret sont prévues pour la ventilation ainsi que pour garantir un fonctionnement en toute sécurité de l'appareil et le protéger de toute surchauffe, et ces ouvertures ne devront donc être ni obstruées ni recouvertes. Ne jamais obstruer les ouvertures en plaçant l'appareil

sur un lit, un sofa, un tapis ou toute surface similaire. Ne jamais placer l'appareil dans un support confiné, par exemple une bibliothèque ou une étagère, sans ventilation suffisante ou sans respecter les instructions du fabricant.

11. Sources d'alimentation

L'appareil devra être alimenté exclusivement sur le type d'alimentation indiqué sur l'étiquette signalétique. Si l'on n'est pas sûr du type d'alimentation du local, consulter le revendeur de l'appareil ou la compagnie d'électricité locale. Pour les appareils qui fonctionnent sur batterie ou sur d'autres sources, voir le mode d'emploi.

12. Mise à la terre ou polarisation

L'appareil est doté d'une fiche trifilaire avec mise à la terre, dont la troisième broche assure la mise à la terre. Cette fiche ne rentrera que dans les prises trifilaires de mise à la terre. Ceci est une mesure de sécurité. Si la fiche ne rentre pas dans la prise, faire remplacer la prise défectueuse par un électricien.

Ne pas rendre vaine la mesure de sécurité assurée par cette prise avec mise à la terre.

13. Protection du cordon d'alimentation

Acheminer les cordons d'alimentation de façon qu'on ne risque pas de marcher dessus ou de les coincer sous un objet placé dessus ou contre eux.

Faire particulièrement attention aux fiches des cordons, à la proximité des prises, et à l'endroit où ils ressortent de l'appareil.

14. Foudre

Pour renforcer la protection de l'appareil pendant un orage, ou si l'on s'en éloigne ou qu'on reste longtemps sans l'utiliser, le débrancher de la source d'alimentation. Ceci permettra d'éviter tout dommage de l'appareil dû à la foudre et aux surtensions de ligne.

15. Surcharge

Ne pas surcharger les prises, rallonges et prises multiples car cela pourrait entraîner un risque de feu ou de choc électrique.

16. Pénétration d'objets et de liquides

Ne jamais enfoncer d'objets d'aucune sorte dans les ouvertures de l'appareil car ils pourraient toucher des points de tension dangereuse ou court-circuiter des pièces, ce qui pourrait provoquer un feu ou un choc électrique. Ne jamais renverser de liquide d'aucune sorte sur l'appareil.

17. Substances inflammables et explosives

Éviter d'utiliser l'appareil en présence de gaz, ainsi qu'à proximité immédiate de substances inflammables et explosives.

18. Chocs ou vibrations violents

Lorsqu'on transporte l'appareil, ne pas le soumettre à des chocs ou des vibrations violents.

19. Réparations

Ne pas tenter de réparer l'appareil soi-même car le fait d'ouvrir ou de retirer les caches risque d'exposer l'utilisateur à des tensions dangereuses

notamment. Confier toute réparation à un personnel qualifié.

20. Dommages nécessitant réparations

Débrancher l'appareil de la source d'alimentation et confier les réparations à un personnel qualifié dans les cas suivants:

- a. Lorsque le cordon d'alimentation ou sa fiche sont endommagés
- b. Si du liquide s'est renversé sur l'appareil ou que des objets sont tombés dedans
- c. Si l'appareil a été exposé à la pluie ou à l'eau.
- d. Si l'appareil ne fonctionne pas normalement lorsqu'on observe les instructions d'utilisation.

Ne régler que les commandes couvertes par le mode d'emploi ; en effet, un réglage incorrect des autres commandes pourrait entraîner des dommages et nécessiteront souvent des travaux de réparation coûteux par un technicien qualifié pour remettre l'appareil en état de marche.

- e. Si l'appareil est tombé ou qu'il a été endommagé.
- f. Si l'appareil affiche une nette modification de ses performances, cela signifie qu'il a besoin d'être réparé.

21. Pièces de rechange

Si l'on a besoin de pièces de rechange, veiller à ce que le technicien de réparation utilise exclusivement les pièces de rechange spécifiées par le fabricant ou des pièces ayant les mêmes caractéristiques que les pièces d'origine. Les pièces de rechange non autorisées risquent de provoquer un feu, un choc électrique et autres dangers.

22. Vérification de sécurité

Après tout travail d'entretien ou de réparation de l'appareil, demander au technicien de réparation d'effectuer les vérifications de sécurité pour s'assurer que l'appareil est en bon état de marche.

23. Montage au mur ou au plafond

L'appareil ne pourra être monté au mur ou au plafond que de la manière recommandée par le fabricant.

24. Chaleur

Eloigner l'appareil des sources de chaleur, telles que radiateurs, appareils de chauffage, cuisinières, et de tout produit engendrant de la chaleur (y compris les amplificateurs).

IMPORTANT NOTICE

USA

These products have been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or modifications not expressly approved by Hitachi Denshi responsible for compliance could void the user's authority to operate the equipment.

For Canada

This product does not exceed the class A/class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations.

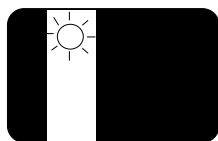
Le présent appareil n'émet pas de bruits radioélectriques dépassant les limites applicable aux appareils numériques de classe A prescrites dans le rVglement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.

Phenomena inherent to CCD imaging device

The following phenomena are inherent to a charge coupled device imaging element and do not indicate malfunction.

1) Smear and blooming

Vertical bands are visible when a strong light enters the scene. Adjust the camera aiming direction carefully to avoid strong direct or reflected light.



2) Fixed pattern noise

High ambient temperature can cause fixed pattern noise to appear throughout the scene.

3) Moire

Interaction between patterns can produce an additional "phantom" pattern to appear. The CCD picture elements (pixels) are arranged in a pattern, which can interact with a pattern in the scene (e.g., a performer wearing a finely striped necktie) to result in a Moire pattern. The effect should be considered when selecting costumes, props and other scene elements.

4) Ghosting

Strong direct or reflected light near an object of interest can cause ghosting of the object to appear in the picture. The effect is more obtrusive with certain iris settings and lens types. Select the scene layout and camera pointing direction carefully in order to avoid this effect.

Operating considerations Notes to users

1. Important safety notes

- Use this camera with a 12VDC power supply,
- Observe that flammable objects, water or metal do not enter the camera interior. These may lead to failure or accident.
- Do not modify the camera or use the camera with external covers removed. These may cause failure, void any warranties and pose a safety hazard.
- Stop using the camera at the approach of electrical storm (thunder audible). Protect the camera from rain if using it outdoors.
- In event the camera shows any abnormality, switch off the camera and disconnect the power cord. Contract a Hitachi Denshi service representative.

2. Handling

- Do not attempt to remove cover.
- When installing or removing a lens, be sure to use care that water or dust does not enter the inside of the camera.

3. Installing and storage

Avoid installing or storing the camera in the following environments.

- Environments exposed to direct sunlight, rain or snow.
- Environments where combustible or corrosive gas exists.
- Excessively warm or cold environment (Operating ambient temperature: -10 to 50°C).
- Humid or dusty environment.
- Place subjected to excessive vibration or shock.
- Environment exposed to strong electric or magnetic field.
- Do not aim the camera lens at the sun.
- Do not shoot strong light.

When such a scene is shot, vertical trailing will appear. However, this is not due to failure. In case strong light enters camera through the lens, partial deterioration in picture quality will result.

4. To obtain stable performance for long time

When the camera is used continuously for long time under high ambient temperature, the inside electrical parts become deteriorated, resulting in shortening its life. To use the camera continuously for long time, the highest temperature must be below 40°C.

5. Connectors

Confirm the power is off before connecting or disconnecting a signal cable. Grasp connectors by the body, not the attached wires.

6. Cleaning

- Use a blower or a lens brush to remove dusts on the lens or the optical filter.
- Wipe dirt on the case off with dry soft cloth. If dirt is hardened, wipe it off with cloth moistened with neutral detergent liquid; wipe the cover with dry cloth.
- Do not use benzene, thinner, alcohol, liquid cleaner or spray-type cleaner.
- In event dust or other debris is lodged between the CCD and optical filter, consult dealer for cleaning by an optical technician.

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Overview

The KP-FD140F/FD32F are single CCD type RGB color camera which utilized the progressive scan CCD image sensor with square pixel for SXGA/VGA format of 1/2-inch which adopted the RGB primary color mosaic filter. The KP-F140F/F32F are a monochrome CCD camera which utilized the progressive scan CCD image sensor with square pixel for SXGA/VGA format of 1/2-inch. The KP-F83F is a monochrome CCD camera which utilized the progressive scan CCD image sensor with square pixel for XGA format of 1/3-inch.

By adoption of an IEEE1394.b interface, high-speed connection of maximum of 800 Mbps can be possible without an image capturing board and special connecting*¹. Moreover, by daisy chain, construction of multiple camera system can be easily performed.

*1: Connected to PC by IEEE1394.b standard cable (when PC connected to camera has IEEE1394.b interface).

Standard composition

Check when unpacking.

Camera (with IR cut filter).....	1
CD ROM (I IDC DRIVER, demonstration, viewer software and Documents)	1
Composition Table / Software License.....	1

Features

•High resolution

The 1/2-inch 1,450,000 pixels (KP-FD140F/F140F), the 1/3-inch 805,000 pixels (KP-F83F) and the 1/2-inch 330,000 pixels (KP-FD32F/F32F) achieve a high resolution of 1360(H) x 1024(V) (SXGA), the 1024(H) x 768(V) and 656(H) x 494(V).

•High color fidelity

The RGB primary color mosaic filter achieves high color fidelity.

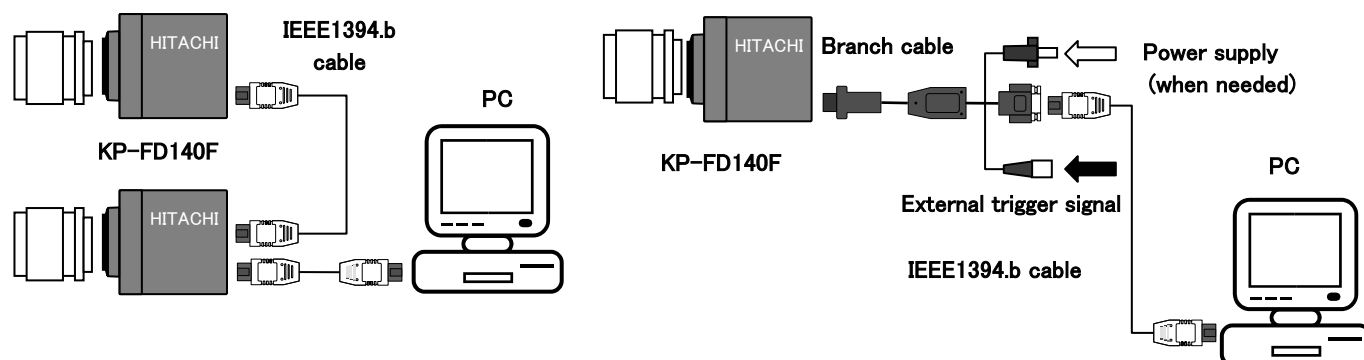
•6 vector masking

Independent six colors masking is the Hitachi innovation for optimizing color balance. The saturation and the hue of 6 colors (Red, blue, green, cyan, magenta and yellow) are adjusted independently to deliver the best color in image capture, microscope and other applications.

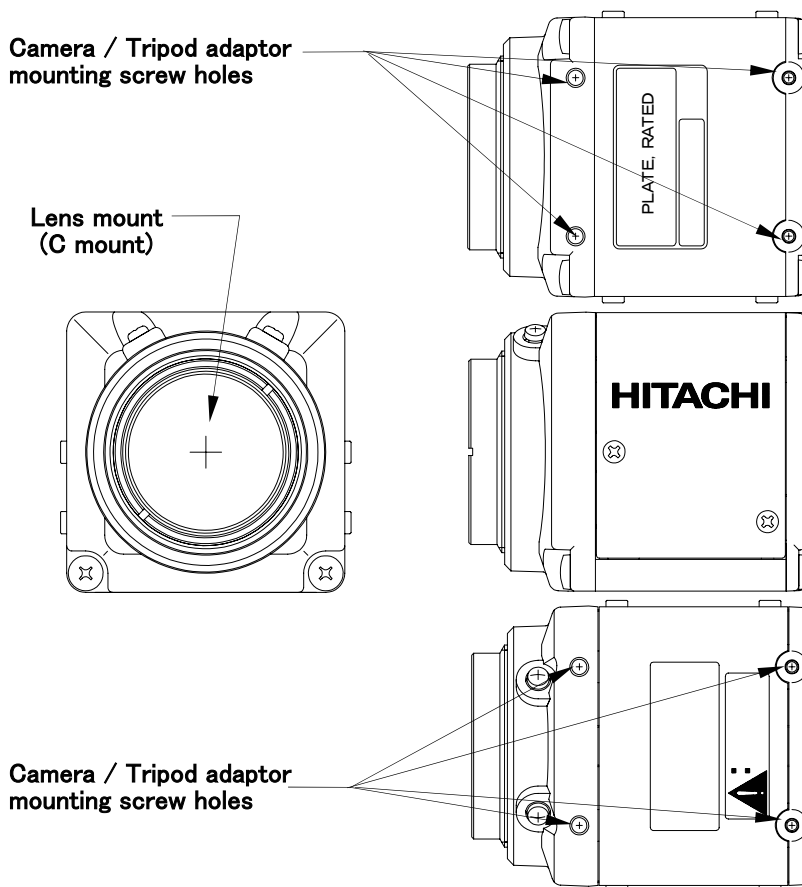
•Daisy chain

Multi camera connection is possible by daisy chain.

System example

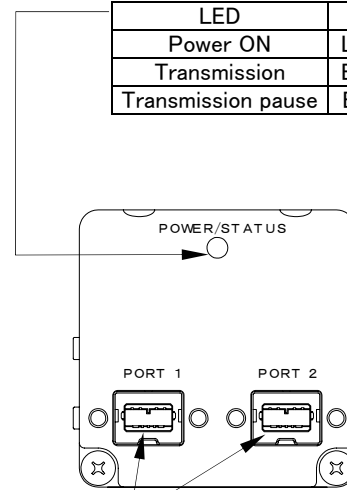


Section name and functions



POWER/STATUS LED

LED	Green	Yellow
Power ON	Light Off	Light off
Transmission	Blink Off	Blink On
Transmission pause	Blink On	Blink Off



IEEE1394 connectors *1

Connect to IEEE1394 connector of PC using IEEE1394 cable.

***1**

When power is supplied from IEEE1394, check for proper current and voltage.

Connector

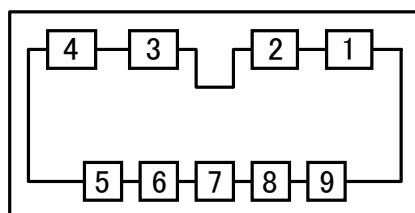
Signal connection to IEEE1394.b (PORT1/PORT2)

1	TPB-	SPECIAL DATA
2	TPB+	
3	TPA-	
4	TPA+	
5	TPA (R)	SHIELD GND
6	VG	POWER GND
7	I/O	* Programmable I/O
8	VP	POWER +12V
9	TPB (R)	SHIELD GND

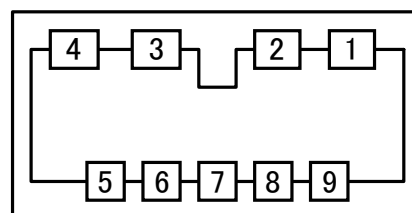
Viewer Soft Setting (PORT1/PORT2)

*Programmable I/O	In	Out
Trigger	○	○
VD	○	○
Strobe (Flash pulse)	×	○

PORT1

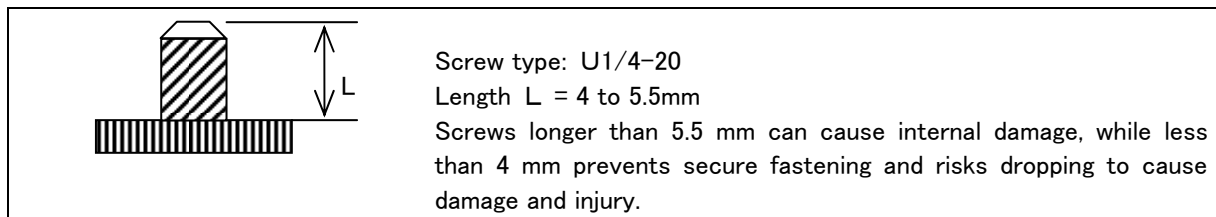


PORT2



Camera mounting

Attached optional accessory the tripod adaptor "TA-FD140", mount the camera to a tripod or mounting bracket.

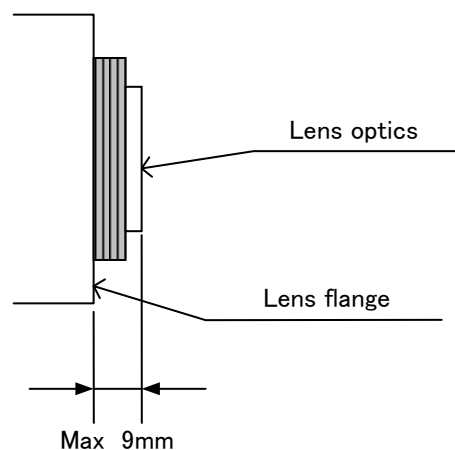


Lens

CAUTION

Observe the dimensions of the lens mounting selection as illustrated at the right.

If the dimensions are not observed, do not use such a lens, because the lens and the camera will be damaged.



Flangeback adjustment is needed in cases where focus cannot be obtained by normal lens focus operation or focus is lost at the maximum telephoto and wide angle settings of a zoom lens. In such cases, open the lens iris and adjust as follows.

1) Fixed focus lens

1. Set the lens focus ring to infinity.
2. Aim toward an object at least 20 meters distant.
3. Loosen the 2 lens mount screws and turn the lens mount ring to adjust the focus. Use care not to disturb the lens focus ring.
4. Tighten the lens mount screws.

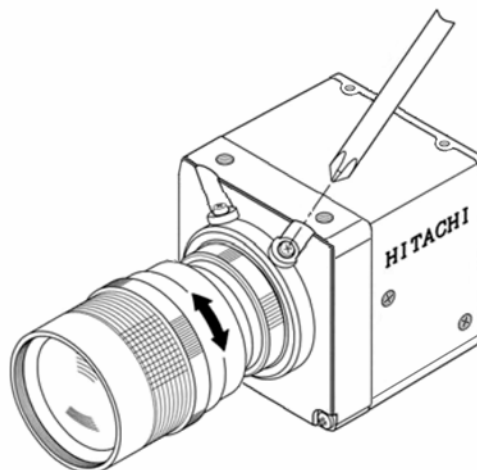
2) Zoom lens

1. Set the lens to telephoto and aim toward an object at least 20 meters distant.
2. Turn the lens focus ring to adjust the focus.
3. Set the lens to wide angle. Loosen the 2 Lens mount screws and turn the lens mount ring to adjust the focus. Use care not to disturb the lens focus ring.
4. Again set to telephoto but adjust the focus by turning the lens mount.
5. Repeat these steps and carefully adjust for best focus.
6. Finally, tighten the lens mount screws.

Note

If using an auto iris lens and the adjustment object distance is less than several meters, due to lens depth of focus relationship, slight blurring can occur at certain iris positions.

In this event, darken the scene so as to open the iris and adjust the focus or flangeback to prevent the blurring.



Control and States Register

KP-FD140F/F140F/FD32F/F32F/F83F can be set by entering predetermined setting commands in the Control and Status register (CSR) of the 1394-based Digital Camera Specification Ver. 1.31.

Common and camera-specific CSR register setting operations are described below.

Indication example: Function name (CSR: xxxx xxxx h)

Function description

Lower 32 bits of 64 bit CSR address are displayed.

ex: F0F0 0800 h

means BUS_ID, NODE_ID, FFFF F0F0 0800 h.

1. IIDC Standard CSR

(1) BRIGHTNESS (CSR: F0F0 0800 h)

Master black level is adjusted.

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

Can be set in range of 00h to FFh. Setting value to 00h side lowers black level. FFh side raises black level.

(2) SHARPNESS (CSR: F0F0 0808 h)

Sharpness level adjustment (object contour correction)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

Contour correction can be set in range of 00h to FFh. Setting value toward 00h side reduces correction for softer contours. Setting toward FFh side increases correction for sharper contours.

(3) WHITE BALANCE (CSR: F0F0 080C h)

White balance adjustment

*only for KP-FD140F and FD32F

-Manual adjustment-

Setting value 820xx0yy h xx: 00h to FFh (B gain)

yy: 00h to FFh (R gain)

White balance is adjusted manually by adjusting R and B gain. Gain is reduced at 00h side and raised at FFh side.

- One Push Auto White Balance (AWB)-

Setting value 86000000 h

State for automatic white balance adjustment.

-AUTO (ATW)-

Setting value 83000000 h

White balance is adjusted in real time (automatic tracking). An effective function when the scene is subject to changes in color temperature of the light source.

(4) GAIN (CSR: F0F0 0820 h)

Electrical sensitivity is adjusted.

-Manual adjustment-

Setting value 82000xxx h xxx: 000h to 1C2h (1dB \div 019h)

Adjusts electrical sensitivity in the range of 0 to 18 dB.

-AUTO-

Setting value 83000000 h

Gain is automatically adjusted in the range of 0 to 18 dB in response to light source brightness.

(5) SHUTTER

(CSR: F0F0 081C h)

Sets electronic shutter speed.

-OFF-

Setting value 80000000 h

Switches off shutter operation.

*The shutter speed (at OFF) is as follows.

- KP-FD140F/F140F 1/30 second (VGA), 1/15 second (SVGA, XGA, SXGA)
- KP-FD32F/F32F 1/60 second
- KP-F83F 1/30 second

-Manual adjustment-

Setting value 82000xxx h xxx: 000h to 600h

Electronic shutter can be set in the range of 10 to 1/100,000 second.

Shutter speed setting value can be derived as follows. (*ShutterSpeed*: μ second)

a) Setting value xyy obtained from exposure time.

$$x = \text{int}(\log(\text{ShutterSpeed}))$$

$$yy = \text{int}\left(\left(\frac{\text{ShutterSpeed}}{10^x} - 1\right) \times \frac{100h}{9}\right)$$

b) Exposure time obtained from setting value.

$$\text{ShutterSpeed} = 10^{x+1} \times \left(1 + \frac{yy}{100h} \times 9\right) [\mu \text{sec}]$$

Ex.1 Exposure time = setting value nnn to obtain 1/125 second (= 8000 μ second).

$$x = \text{int}(\log(8000)) = 3$$

$$yy = \text{int}\left(\left(\frac{8000}{10^3} - 1\right) \times \frac{100h}{9}\right) = C7h$$

$$\therefore nnn = 2C7$$

Ex.2 Setting value 25Dh that produces 1/234.22 second exposure time.

$$\begin{aligned}\text{ShutterSpeed} &= 10^{2+1} \times \left(1 + \frac{5Dh}{100h} \times 9\right) \\ &= 4269.53 \quad [\mu \text{sec}] \\ &= \frac{1}{234.22} \quad [\text{sec}]\end{aligned}$$

-AUTO-

Setting value 83000000 h

Auto electronic shutter operates to vary the shutter speed in the range of 10 to 1/100,000 second in response to light source brightness.

If light is excessive, a suitable level is selected for maintaining a video output. This function is effective when using microscope or other optical system without an automatic lens iris.

(6) AUTO EXPOSURE

(CSR: F0F0 0804 h)

At auto gain (AGC) or shutter (AES) setting, the sensitivity is automatically adjusted to maintain the proper video level.

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

Video level decreases toward 00h and increases toward FFh.

(7) GAMMA**(CSR: F0F0-0818 h)**

Gamma correction is adjusted.

-OFF-

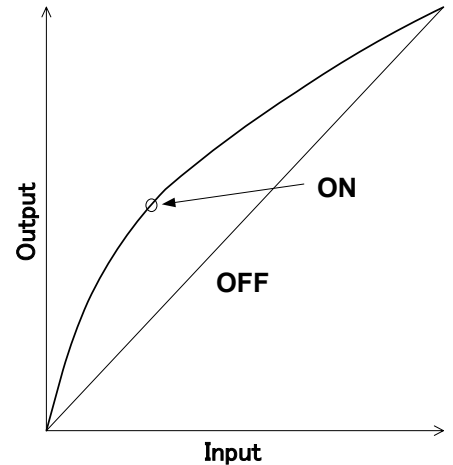
Setting value 80000000h

Gamma correction is set to OFF.

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (Standard 00h)

Adjust the detail gamma.

**(8) TRIGGER****(CSR: F0F0 0830 h)**

Sets external trigger operating mode.

-OFF-

Setting value 80000000h

Trigger function set to OFF.

-Manual adjustment-

Setting value 8xyz0000 h

x: 2- LOW ACTIVE, 3- HIGH ACTIVE (POLARITY)

y: 0- PORT1, 2- PORT2, E- SOFTTRIGGER (SOURCE)

z: 0- MDOE0, 1- MODE1, 3- MODE3, E- MODE14, F- MODE15 (MODE)

External trigger signal polarity is switched at value x. Trigger source is switched at value y. Trigger mode is switched at value z.

See "Trigger operation and timing chart" (page 13 to 16).

(9) TRIGGER DELAY**(CSR: F0F0 0834 h)**

Adjust a gap of few time form noticing trigger pulse to starting exposure.

-OFF-

Setting value 80000000 h

Trigger delay is set OFF.

-Duration of delay adjustment-

Setting value 82000xxx h

xxx: 000h to FFFh (standard: 000 h)

Adjust the delay time from 000h (0.4 μ s) to FFFh (3931.6 μ s) by 0.96 μ s steps.**(10) SOFTWARE TRIGGER****(CSR: F0F0 0000 h)**

Run software trigger.

-ON-

Setting value 82000000 h

-OFF-

Setting value 80000000 h

(11) INITIALIZE**(CSR: F0F0 0000 h)**

Return equipment to status at time of release from factory.

-Initialization-

Setting value 80000000 h

(12) MEMORY SAVE (EXECUTE)**(CSR: F0F0 0618 h)**

Make back up of presently effective memory channels.

-BACK UP execute-

Setting value 80000000 h

(13) MEMORY SAVE (Ch SET)**(CSR: F0F0 0620 h)**

Select channel carried out memory backup.

-channel set-

Setting value x0000000 h x: 1- ch1, 2- ch2, 3- ch3, 4- ch4

(14) CURRENT MEMORY

(CSR: F0F0 0624 h)

Loading memory channel designating data

-LOADBACK UP execute-

Setting value x00000000 h x: 0- FACTORY SETUP, 1- ch1, 2- ch2, 3- ch3, 4- ch4

2. Advance CSR

2-1. Image color reproduction and color balance related CSR

(1) MASKING

(CSR: F200-0020 h)

RGB and Ye Cy Mg color saturation and hue can be separately varied (6 vector independent masking). Color reproduction detail and fidelity are effectively enhanced.

When engaged, **R saturation (CSR: F200 0024)** - **M hue ((CSR: F200 0050)** can be set, with color phase and saturation adjusted for each color phase.

*** This function is only for KP-FD140F and KP-FD32F.**

-OFF-

Setting value 80000000 h

-ON-

Setting value 82000000 h

a) (MASKING) R SATURATION

(CSR: F200 0024 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)

b) (MASKING) Y SATURATION

(CSR: F200 0028 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)

c) (MASKING) G SATURATON

(CSR: F200 002C h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)

d) (MASKING) C SATURATION

(CSR: F200 0030 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00hto FFh (standard 80h)

e) (MASKING) B SATURATION

(CSR: F200 0034 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)

f) (MASKING) M SATURATION

(CSR: F200 0038 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)

g) (MASKING) R HUE

(CSR: F200 003C h)

-Manual adjustment-

Setting value 820000xx h

xx: 00hto FFh (standard 80h)

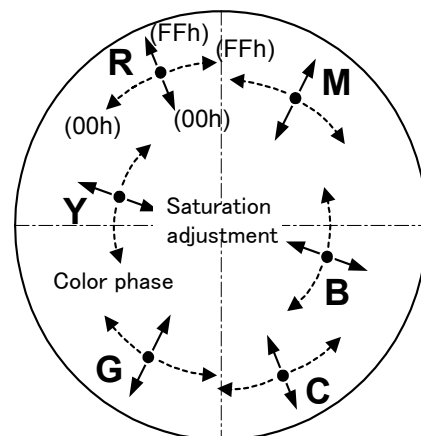
h) (MASKING) Y HUE

(CSR: F200 0040 h)

-Manual adjustment-

Setting value 820000xx h

xx: 00h to FFh (standard 80h)



i) (MASKING) G HUE (CSR: F200 0044 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

j) (MASKING) C HUE (CSR: F200 0048 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

k) (MASKING) B HUE (CSR: F200 004C h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

l) (MASKING) M HUE (CSR: F200 0050 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

(2) PAINT BLACK

Color level of R,G, and B can be separately varied.

*** This function is only for KP-FD140F and KP-FD32F.**

a) (PAINT BLACK) RED (CSR: F200 0120 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 00h)

Color level of RED is adjusted manually. Color level is reduced at 00h side and raised at FFh side.

b) (PAINT BLACK) GREEN (CSR: F200 0124 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 00h)

It is same as RED.

c) (PAINT BLACK) BLUE (CSR: F200 0128 h)

-Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 00h)

It is same as RED

2-2. Setting of other function related CSR

(1) PORT1 (CSR: F200 0000 h)

-OFF-

Setting value 80000000 h

-SELECT INPUT/OUTPUT SIGNAL-

Setting value 82000000x h

x: 0- TRIGGER IN, 1- STROBE OUT, 2- VD OUT, 3- PORT2 OUT

Input and output signal is switched at value of x. When TRIGGER SOURCE is PORT1, x is set to TRIGGER IN automatically.

PORT2 (CSR: F200 0004 h)

-OFF-

Setting value 80000000 h

-SELECT INPUT/OUTPUT SIGNAL-

Setting value 82000000x h

x: 0- TRIGGER IN, 1- FLUSH OUT, 2- VD OUT, 3- PORT1 OUT

It is same as PORT1.

(2) READOUT SET (CSR: F200 0008 h)

Set readout source for mode 14 (Reset control) trigger operation.

-OFF-

Setting value 80000000 h

-ON-

Setting value 8xy0000z h

x: 2- LOW ACTIVE, 3- HIGH ACTIVE

y: 0- SourceID0(PORT1), 2- SourceID1(PORT2), E- SourceID7(Software)

z: 1- SET

Readout signal polarity is switched at value of x. Readout signal source is switched at value of y. When set SourceID7, if z is set to 1, a picture is outputted (and z becomes 0 automatically).

(3) TIME STAMP

(CSR: F200 000C h)

The cycle timer value of 1394 buses can be added to image data as the time stamp.

-OFF-

Setting value 80000000 h

-ON-

Setting value 82000000 h

If TIME STAMP is ON, first 4 byte of image data is changed to time stamp information as follows.

0 h								1 h								2 h								3h							
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Second Count								Cycle Count								Cycle Offset															

(4) HD RESET

(CSR: F200 0010 h)

When using TRIGGER MODE, internal HD is reset and start exposure.

-OFF-

Setting value 80000000 h

-ON-

Setting value 82000000 h

(5) CYCLE TIMER SYNC

(CSR: F200 0010 h)

Camera is synchronized to cycle timer in same bus.

All camera set to normal mode and same frame rate.

-OFF-

Setting value 80000000 h

-ON-

Setting value 82000000 h

(6) PORT1 OUTPUT

(CSR: F300 0200 h)

PORT2 OUTPUT

(CSR: F300 0204 h)

Output strobe pulse / camera VD / other port input (switched PORT SETTING) from PORT1 / PORT2. These timing can be signal timing of PORT1 and PORT2 for trigger operation.

-OFF-

Setting value 80000000h

Signal output absent.

-ON-

Setting value 8xyyyzzz h

x: 2- LOW ACTIVE/THROUGH, 3- HIGH ACTIVE/REVERSE

yyy: 000h to FFFh

zzz: 000h to FFFh

When output signal is Strobe out/Camera VD, polarity is switched at value of x. When output signal is Other port input, polarity is reversed or not reversed at value of x. When output signal is Strobe out/Other port input, adjust delay time at value of yyy from 0.2 to 3931.4 μ s by 0.96 μ s step. When output signal is Strobe out, adjust output signal pulse width at value of zzz from 0.96 to 3931.2 μ s by 0.96 μ s step. But, when zzz is set to 000h, Strobe out is stopped at the time of end of exposure.

See "Trigger operation and timing chart" (page 13 to 16).

Video format

1. KP-FD140F/F140F

A. Fixed format

Format	Mode	Image Size	Color Coding	Frame Rate				
				30	15	7.5	3.75	1.875
0	3	640 x 480	YUV(4:2:2)	○	○	○	○	○
	4	640 x 480	RGB	○	○	○	○	○
	5	640 x 480	YMONO8	○	○	○	○	○
	6	640 x 480	YMONO16	○	○	○	○	○
1	0	800 x 600	YUV(4:2:2)	—	○	○	○	
	1	800 x 600	RGB	—	○	○		
	2	800 x 600	YMONO 8	—	○	○		
	3	1024 x 768	YUV(4:2:2)	—	○	○	○	○
	4	1024 x 768	RGB	—	○(*)	○	○	○
	5	1024 x 768	YMONO 8	—	○	○	○	○
	6	800 x 600	YMONO 16	—	○	○	○	
	7	1024 x 768	YMONO 16	—	○	○	○	○
2	0	1280 x 960	YUV(4:2:2)	—	○(*)	○	○	○
	1	1280 x 960	RGB	—	○(*)	○	○	○
	2	1280 x 960	YMONO 8	—	○	○	○	○
	6	1280 x 960	YMONO 16	—	○(*)	○	○	○

B. Free format (Format7)

Format	Mode	Image Size	Color Coding	Packet Size [Byte]			
7	0	1360 x 1024	YUV(4:2:2)	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	RGB	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	YMONO 8	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	YMONO 16	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	RAW8	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	RAW16	8192 (*)	6144 (*)	4096	2048
		1360 x 1024	RGB48	8192 (*)	6144 (*)	4096	2048

 KP-FD140F only

(*) required S800 data transmission rate.

3. KP-FD32F/F32F

A. Fixed format

				Frame Rate					
Format	Mode	Image Size	Color Coding	60	30	15	7.5	3.75	1.875
0	3	640 x 480	YUV(4:2:2)	○(*)	○	○	○	○	○
	4	640 x 480	RGB	○(*)	○	○	○	○	○
	5	640 x 480	YMONO8	○	○	○	○	○	○
	6	640 x 480	YMONO16	○(*)	○	○	○	○	○

B. Free format (Format7)

Format	Mode	Image Size	Color Coding	Packet Size [Byte]			
7	0	656 x 492	YUV(4:2:2)	7872 (*)	5940 (*)	3936	1968
		656 x 492	RGB	7872 (*)	5940 (*)	3936	1968
		656 x 492	YMONO 8	7872 (*)	5940 (*)	3936	1968
		656 x 492	YMONO 16	7872 (*)	5940 (*)	3936	1968
		656 x 492	RAW8	7872 (*)	5940 (*)	3936	1968
		656 x 492	RAW16	7872 (*)	5940 (*)	3936	1968
		656 x 492	RGB48	7872 (*)	5940 (*)	3936	1968
	1	640 x 480	YUV(4:2:2)	7680 (*)	5760 (*)	3840	1920
		640 x 480	RGB	7680 (*)	5760 (*)	3840	1920
		640 x 480	YMONO 8	7680 (*)	5760 (*)	3840	1920
		640 x 480	YMONO 16	7680 (*)	5760 (*)	3840	1920
		640 x 480	RAW8	7680 (*)	5760 (*)	3840	1920
		640 x 480	RAW16	7680 (*)	5760 (*)	3840	1920
		640 x 480	RGB48	7680 (*)	5760 (*)	3840	1920

■ KP-FD32F only

(*) required S800 data rate.

3. KP-F83F

A. Fixed format

				Frame Rate				
Format	Mode	Image Size	Color Coding	30	15	7.5	3.75	1.875
0	5	640 x 480	YMONO8	○	○	○	○	○
	6	640 x 480	YMONO16	○	○	○	○	○
1	2	800 x 600	YMONO 8	○	○	○	○	○
	5	1024 x 768	YMONO 8	○	○	○	○	○
	6	800 x 600	YMONO 16	○	○	○	○	○
	7	1024 x 768	YMONO 16	○(*)	○	○	○	○

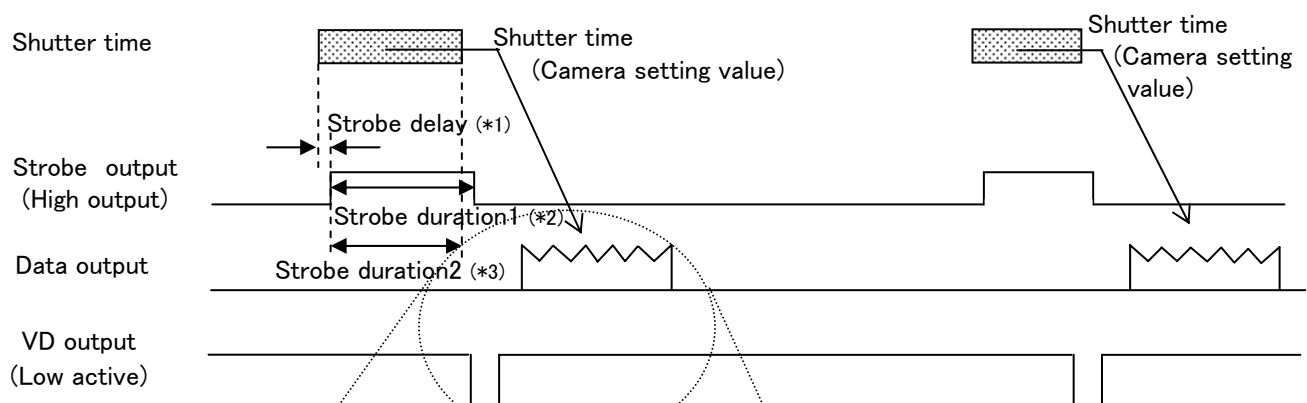
B. Free format (Format7)

Format	Mode	Image Size	Color Coding	Packet Size [Byte]			
7	0	1024 x 768	YMONO 8	8192 (*)	6144 (*)	4096	2048
		1024 x 768	YMONO 16	8192 (*)	6144 (*)	4096	2048

(*) required S800 data rate.

Trigger operation and timing chart

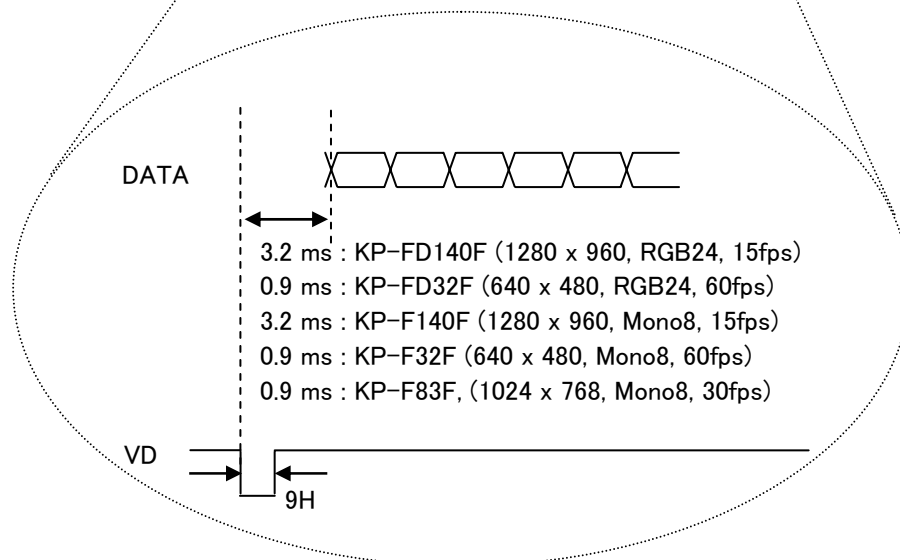
1. Normal mode



(*1) $0.27 \sim 3930.51 \mu s$ $0.96 \mu s/\text{step}$

(*2) $0.96 \sim 3931.2 \mu s$ $0.96 \mu s/\text{step}$

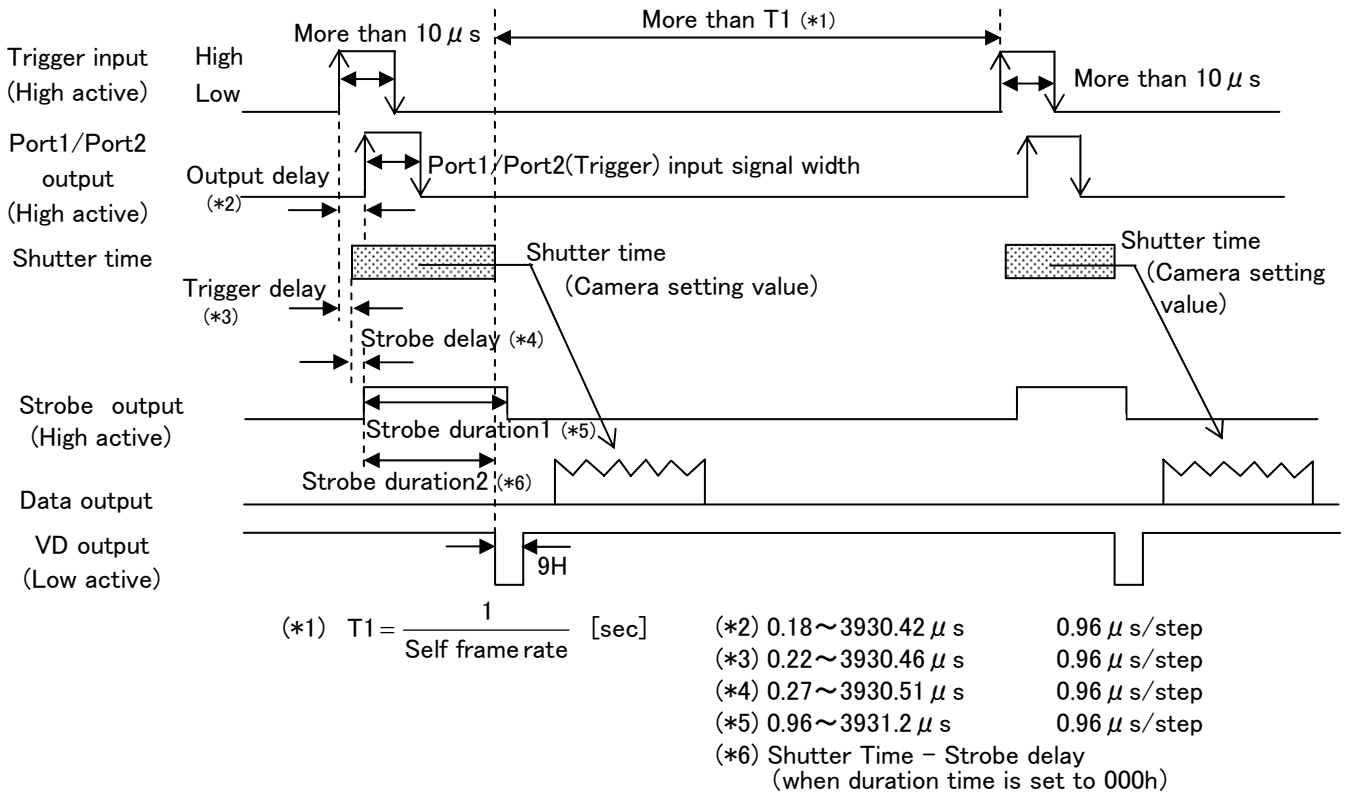
(*3) Shutter Time - Strobe delay
(when duration time is set to 000h)



2. Fixed shutter mode (External trigger operating mode: Mode 0)

When external trigger signal is high active, after the trigger signal rise edge, the strobe signal start/end can be set to determine the strobe time.

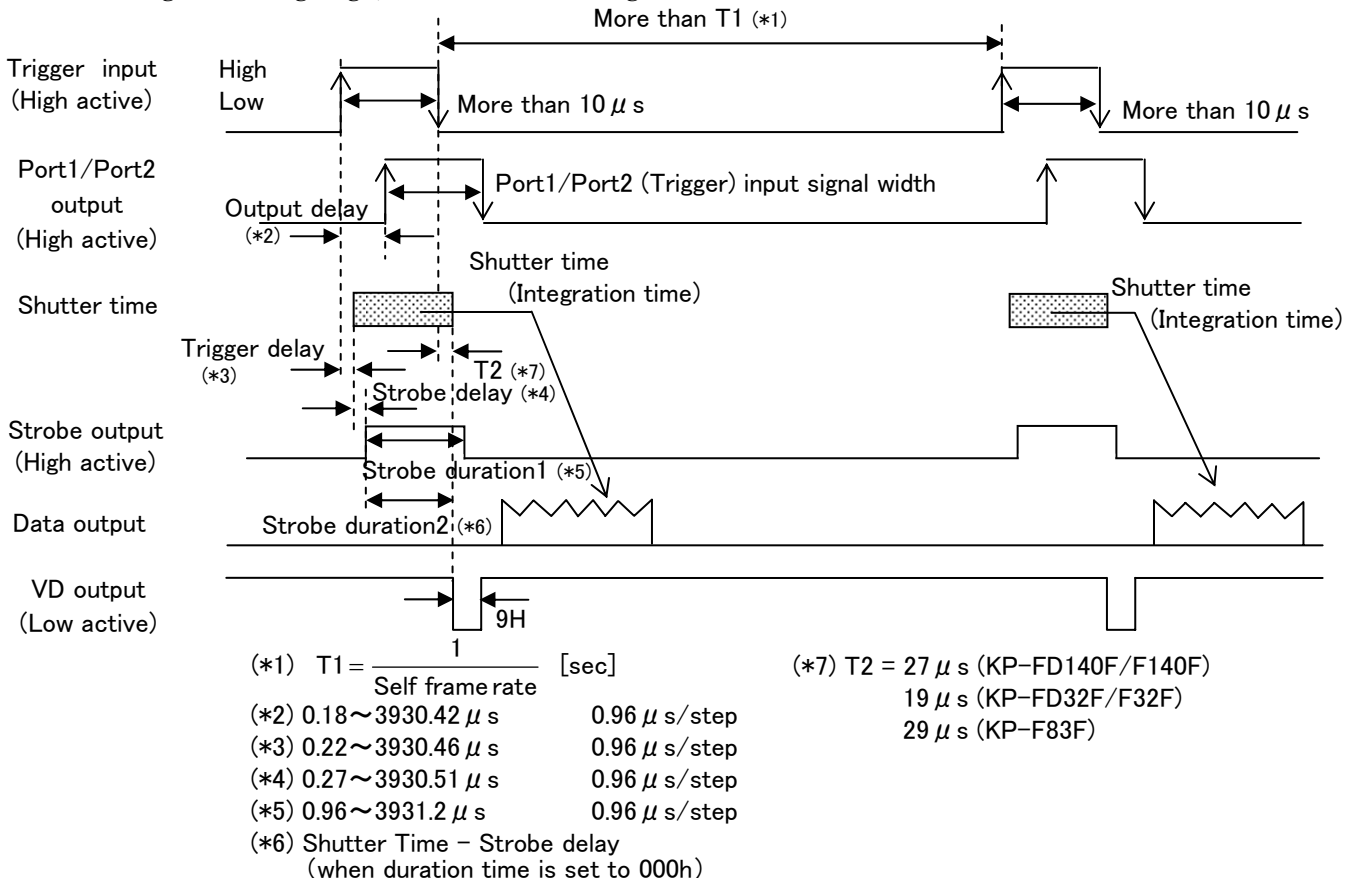
At the strobe signal falling edge, the internal VD signal is reset and the video data are transmitted.



3. One trigger mode (External trigger operating mode: Mode 1)

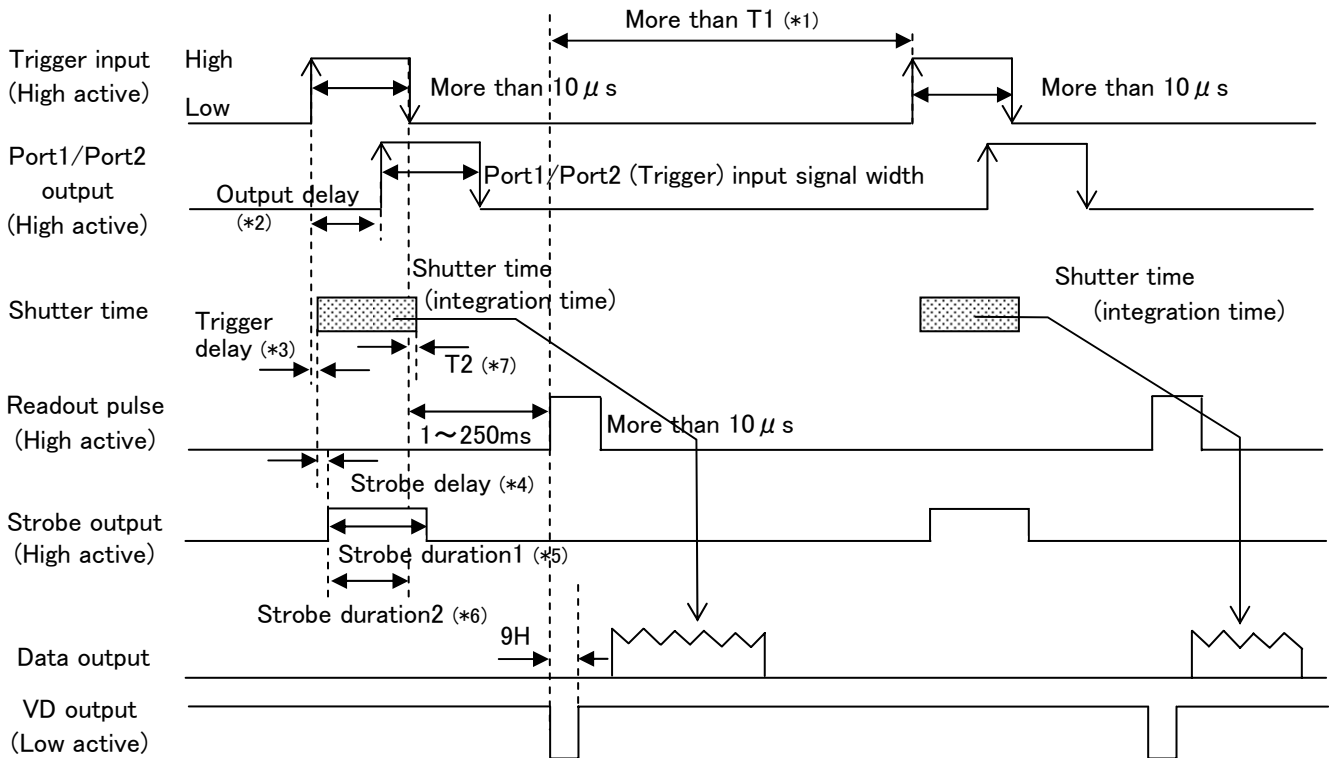
When external trigger signal is high active, after the trigger signal rise edge, the strobe signal start/end can be set to determine the strobe time.

At the flash signal falling edge, the internal VD signal is reset and the video data are transmitted.



4. Reset control (External trigger operating mode: Mode 14)

When the external trigger signal is HIGH ACTIVE, exposure begins at the rising edge of the trigger signal and ends at the falling edge. At the Readout pulse falling edge, the internal VD signal is reset and the video data are transmitted.



(*1) $T1 = \frac{1}{\text{Self frame rate}}$ [sec]

(*2) $0.19 \sim 3930.43 \mu s$ $0.96 \mu s / \text{step}$

(*3) $0.22 \sim 3930.46 \mu s$ $0.96 \mu s / \text{step}$

(*4) $0.28 \sim 3930.52 \mu s$ $0.96 \mu s / \text{step}$

(*5) $0.96 \sim 3931.2 \mu s$ $0.96 \mu s / \text{step}$

(*6) Shutter Time - Strobe delay
(when duration time is set to 000h)

(*7) $T2 = 93 \mu s$ (KP-FD140F/F140F)

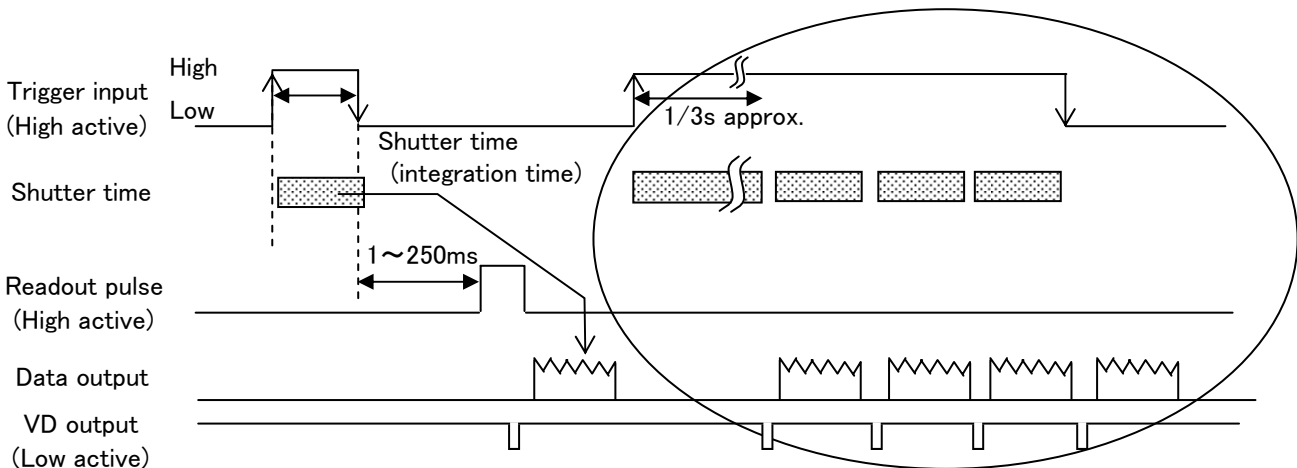
$56 \mu s$ (KP-FD32F/F32F)

$58 \mu s$ (KP-F83F)

Note: Special function of reset control trigger

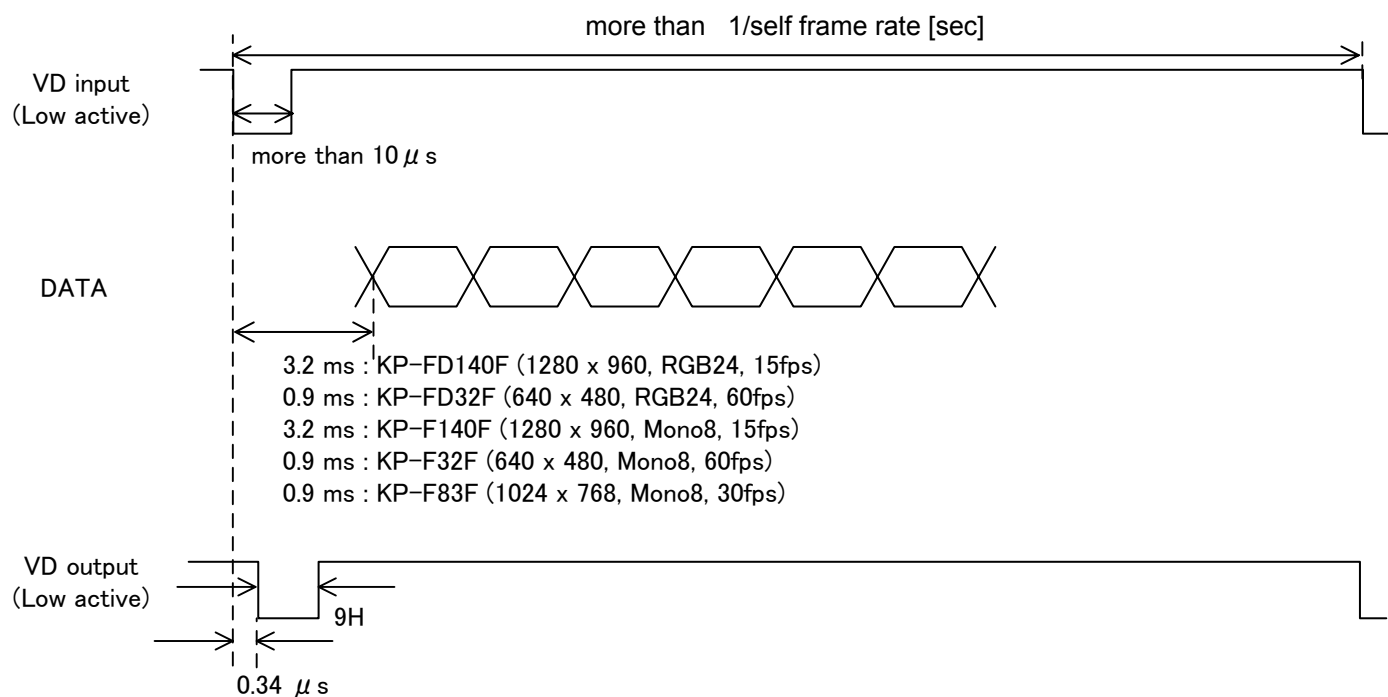
The camera shifts to the output of a normal mode (continuous output) when Trigger B signal passes about 1/3 seconds in the state of High. (The image is output by inputting the Trigger at the VD cycle for this period.)

It returns to the Reset control mode if Trigger B signal becomes Low. However, after becoming Low Trigger B, the period of 50 ms becomes a Trigger A signal input prohibition period.



5. VD synchronization (External trigger operating mode: Mode 15)

Please input the sync pulse of following specification, in the case that camera synchronization locks the external synchronization.



Note: When VD synchronization function, please set same frame rate speed. If set difference frame rate, cameras are not synchronized normally.

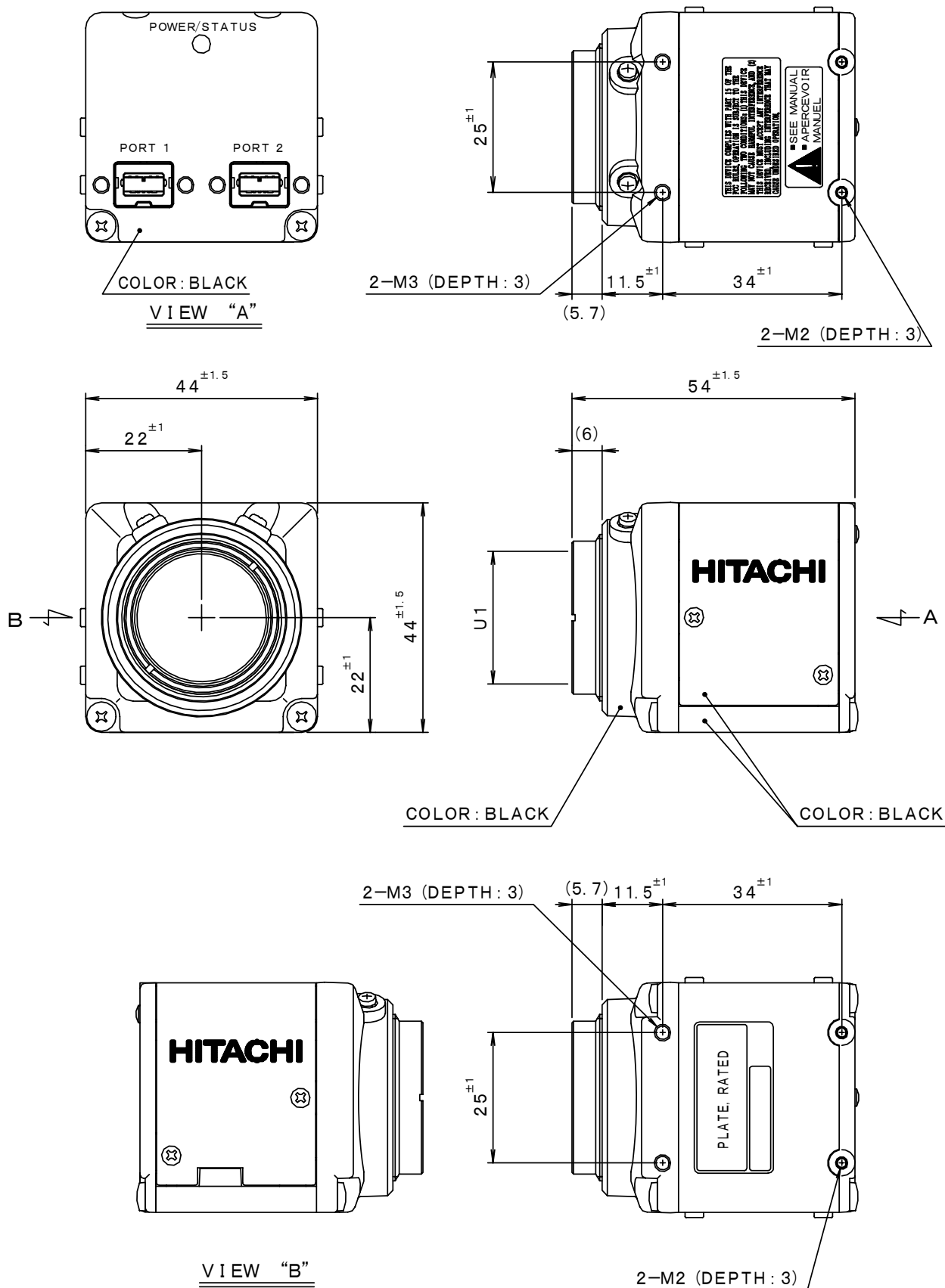
Specifications

Specifications of KP-FD140F/F140F/FD32F/F32F/F83F are showing.

	KP-FD140F/F140F	KP-FD32F/F32F	KP-F83F
1) Imaging device	1/2-inch interline CCD		1/3-inch interline CCD
Total pixels	1434 (H) x 1050 (V)	692(H) x 504(V)	1079(H) x 789(V)
Effective pixels	1392 (H) x 1024 (V)	656(H) x 492(V)	1034(H) x 779(V)
Pixel size	4.65 μ m (H) x 4.65 μ m (V)	9.9 μ m (H) x 9.9 μ m (V)	4.65 μ m (H) x 4.65 μ m (V)
Color filter	RGB primary color mosaic filters (FD140/FD32F)		
2) Scanning system	Progressive scan		
3) Synchronization	Internal / external (auto selection)		
4) Video signal output			
Interface	IEEE1394.b (FireWire800)		
Protocol	IEEE1394-based Digital Camera Specification Version 1.31 compliant		
Transfer rate	800 / 400 / 200Mbps		
Image format	RGB24 / RGB48 / YUV4:2:2 / RAW8 / RAW16 for FD140F/FD32F MONO8 / MONO16 for all model		
Image size	1360(H) x 1024(V) 1280(H) x 960(V) 1024(H) x 768(V) 800(H) x 600(V) 640(H) x 480(V)	656(H) x 492(V) 640(H) x 480(V)	1024(H) x 768(V) 800(H) x 600(V) 640(H) x 480(V)
Frame rate	15fps (1360 x 1024)	60fps (656 x 492)	30fps (1024 x 768)
5) Standard sensitivity	2000lx F5.6 : KP-FD32F/F32F, 2000lx F8 : KP-FD140F/F140F/F83F		
6) Minimum illumination	10lx (F1.4 Gain Max) : KP-FD32F/F32F, 5lx (F1.4 Gain Max) : KP-FD140F/F140F/F83F		
7) Gain	Auto / Manual (0dB to 18dB)		
8) Electric shutter	Auto (AES) / Manual (VARIABLE) 1/100,000 second to 10 second		
9) External trigger shutter			
Mode	Fixed shutter (Mode0), One trigger (Mode1) Reset control (Mode14), VD Sync (Mode15)		
Input	Via IEEE1394 cable (Software trigger) Our company original method (Hardware trigger)		
10) Power supply	Approx. 4.1W (DC+12V)	Approx. 3.5W (DC+12V)	Approx. 3.2W (DC+12V)
11) White balance	ATW / MANUAL / One-Push (FD140F/FD32F)		
12) Gamma	OFF/LUT		
13) Masking	OFF / ON (6 color independent masking)		
14) Saturation	Adjustable (FD140F/FD32F)		
15) Sharpness	Adjustable		
16) Brightness	Adjustable		
17) Time stamp	OFF/ON		
18) Cycle timer sync	OFF/ON		
19) Daisy chain	Possible. Even if there is no repeater. If two are connected, the frame rate become half.		
20) Lens mount	C mount (Flange-back adjustment)		
21) Power supply	DC+8V to +30V (Via IEEE1394 cable)		
22) Ambient temperature			
Operating	-10°C to +50°C, 30 to 80%RH Note: If operated continuously, be sure to use at 0°C to +40°C (104F) for long term stable performance.		
Storage	-20°C to +60°C / 20 to 90%RH		
23) Vibration endurance	68.56m/s ² (10 to 200Hz 30 minutes each on XYZ axes) *Please do not add the strong vibration over long time.		
24) Shock endurance	490.3m/s ² (vertical, horizontal, once each faze)		
25) Dimensions	44(W) x 44(H) x 54(D)mm (not including lens)		
26) Mass	Approx. 130g (not including lens)		
27) Standard composition	Camera, CD-ROM (Operation manual, Driver, SDK),Composition		

Dimensions

- UNIT : mm
- MASS : APPROX 130 g



About CD-ROM

Attached CD-ROM has the following composition. * means folder.

```

Reame.txt
*HitachiKokusai --*Documents ---- *Japanese ----- CameraOperationManual(J).pdf, VieweManual(J).pdf
                  -- *English ----- CameraOperationManual(E).pdf, ViewerManual(E).pdf
                  --*Viewersoftware -- HiKE1394CamView.exe

*Technoscope --*Documents ---- ZCLAPI.pdf, ZCLDrvInstall.pdf
                --*Driver ----- COM.dll, ZCL.dll, ZCLDrv.dll, ZCLDrv.inf, ZCLDRV.sys
                --*ZCL-1 ----- *COMMON ----- ZCL.lib, ZCLAPI.h
                                -- *Sample1: (Source cord of sample program 1)
                                -- *SampleEXE----- Sample1.exe, test.exe

```

(1) Readme.txt : The file that explain the directory tree of CD-ROM.

(2) HitachiKokusai

This folder has documents about camera and viewer software.

- CameraOperationManual(J)/(E).pdf : The operation manual of camera (this file) in English and Japanese.
- ViewerManual(J)/(E).pdf : The operation manual of viewer software in English and Japanese.
- HiKE1394CamView.exe : The viewer software.

(3) Technoscope

This folder has driver for using viewer software and SDK (Software Development Kit) "ZCL-1" to develop new software.

- ZCLDrvInstall.pdf : The install manual of driver.
- ZCLAPI.pdf : The manual of SDK (specifications of library functions).
- *Driver : The folder including files about driver.
- *ZCL-1 -- *COMMON : The folder including library file and header file for development using SDK.
- *ZCL-1 -- *Sample1 : The folder including source codes of each sample software.
- *ZCL-1 -- *SampleEXE : The folder including EXE file of each sample software.

Note:

- 1) The included driver and also demonstration software within CD-ROM operate only in Windows 2000/XP.
- 2) The viewer software may not operate normal when it is used for the other camera, because software for Hitachi Kokusai Electric.
- 3) In the case that it stopped normal operating during the use of viewer software, stop viewer software, turn off and on the camera power supply or pull and push the IEEE1394 cable, execute viewer software once again.
- 4) In the case that the performance (the CPU clock, installation memory etc.) of PC is not sufficient, viewer software may not execute normally. Please use PC of following specification.

Item	Specifications
CPU	Intel Celeron 533MHz or more
Memory	256MByte or more
Display Card	24bit RGB color display card or more
Interface Card	Built-in OHCI IEEE1394 port or PCI-Card
Operating System	Windows 2000 / XP

- 5) Hitachi Kokusai Electric Inc. does not guarantee regarding the faulty, damage of the hardware and also software of the customer by a driver and also viewer software.
- 6) SDK is out of support.

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